REMARKS/ARGUMENTS

The Office Action mailed March 14, 2003, has been received and reviewed. Claims 1 through 30 are currently pending in the application. Claims 1 through 30 stand rejected. Applicant has amended claims 1 and 24, and respectfully requests reconsideration of the application as amended herein.

Preliminary Amendment

Applicant's undersigned attorney notes the filing herein of a Preliminary Amendment on April 15, 2002, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed for some reason to have been entered in the Office file, Applicant's undersigned attorney will be happy to have a true copy thereof hand-delivered to the Examiner.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 5,677,576 to Akagawa in View of U.S. Patent No. 5,872,051 to Fallon et al.

Claims 1 through 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Akagawa (U.S. Patent No. 5,677,576) in view of Fallon et al. (U.S. Patent No. 5,872,051). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 1-30 are improper because the cited references do not teach or suggest the invention as presently claimed.

Independent claim 1, as amended herein, requires forming a layer of encapsulation material to cover an active surface of the semiconductor wafer and to surround a planarized conductive bump; and reforming the conductive bump to a preplanarized shape extending above encapsulation material layer and away from at least a portion of said encapsulation material adjacent to said conductive bump. Independent claim 24, as amended, requires forming a layer of encapsulation material on at least a portion of an active surface of said semiconductor die to surround a planarized conductive bump; and reforming said conductive bump to a preplanarized shape extending above said layer and away from at least a portion of said encapsulation material adjacent to said conductive bump. In other words, as illustrated in Figures 4, 5, and 19, the encapsulation material is formed around the conductive bump when the latter is in its planarized (compressed) state. Once the conductive bump is reformed to its preplanarized shape, the conductive bump extends upwardly above the encapsulation material and away from portions of the encapsulation material lying adjacent to the conductive bump.

The Examiner relies on Akagawa as disclosing the formation of conductive traces 40 over an active surface of a semiconductor wafer 32, wherein the bottom surface of a first end of each conductive trace is in contact with at least one bond pad 36 on the active surface. (Office Action at pg. 2). Akagawa is said to further disclose forming a conductive bump 46 on a top surface of a second end of the conductive traces 40 and forming a layer of encapsulation material 42 to cover the active surface of the semiconductor wafer to surround the conductive bump. (*Id.* at pgs 2-3). As acknowledged by the Examiner, Akagawa fails to disclose planarizing the top portion of the conductive bump and reforming the conductive bump to a preplanarized shape extending above the layer. The Examiner then relies on Fallon as disclosing the planarization of the top portion of the conductive bump 624 (FOG. 25) and reforming the conductive bump to a preplanarized shape 630 extending above the layer.

The combination of Akagawa and Fallon, however, do not teach or suggest all of the limitations of independent claims 1 and 24. For example, Akagawa does not teach or suggest

forming a layer of encapsulation material surround a planarized conductive bump. Instead, the layer of encapsulation material in Akagawa is formed adjacent to the conductive bumps that are in a normal, non-planarized state. Likewise, Fallon does not overcome Akagawa's failure to teach or suggest reforming the conductive bump to a preplanarized shape extending above said layer and away from at least a portion of said encapsulation material adjacent to said conductive bump. Instead, Fallon discloses planarizing a top portion of a conductive bump 624 that is located on a bond pad 602, and not located on a top surface at said second end of said conductive traces, as required by independent claims 1 and 24. As such, Fallon teaches away from the concept of forming a conductive bump on a conductive trace, as recited in both claims 1 and 24 and in Akagawa.

Notably, Fallon also fails to teach or suggest formation of an encapsulation material to surround a conductive bump that has been planarized. Finally, Fallon fails to teach or suggest reformation of the conductive bump to extend away from at least a portion of said encapsulation material lying adjacent to the conductive bump. Thus, the combination of Akagawa and Fallon, even to the extent that they could permissibly be combined (and ignoring those portions that teach away from such combination), do not teach or suggest forming an encapsulation material having a shape that surrounds a planarized conductive bump and then reforming the conductive bump to extend above the layer and away from portions of the layer that were formed to the shape of the planarized conductive bump (*i.e.*, those portions lying adjacent to the conductive bump).

A *prima facie* case of obviousness cannot be established where, as in the instant case, the teachings of the references teach away from the invention as presently claimed in the application, or where the combined prior art references fail to teach or suggest all of the claim limitations. In view of the foregoing, reconsideration and withdrawal of the Section 103 rejection to claims 1 through 24 (and claims 2-23 and 25-30 that depend therefrom) is respectfully requested.

ENTRY OF AMENDMENTS

The amendments to claims 1 and 24 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 1-30 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,

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